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Eucalyptus ambigua is not the correct name for the Smithton Peppermint of Tasmania

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Introduction

The Tasmanian endemic tree known as Black Peppermint, *Eucalyptus amygdalina* Labill., was described by J.J.H. de Labillardière (1806) from material he collected in Tasmania during the D'Entrecasteaux expedition in 1792 or 1793. Material also gathered by Labillardière during the same voyage was used by A.P. de Candolle (1828) to describe *E. ambigua* DC. (Bean 2009). Subsequently, J.D. Hooker (1856) described *E. nitida* Hook.f. from material collected by R.C. Gunn and, in the same year, F.A.W. Miquel (1856) described *E. tenuiramis* Miq. from material collected by Charles Stuart. Bentham (1867) used a broader concept of *E. amygdalina*, and treated *E. tenuiramis* as a synonym of this name, as well as treating both *E. nitida* and *E. ambigua* as synonyms of *E. amygdalina* var. *nitida* (Hook.f.) Benth. Maiden (1905) agreed with Bentham on the taxonomic identity of *E. ambigua*, but also considered the possibility that it might instead be *E. stricta* Sieber ex Spreng. Blakely (1934) took this further in his *A key to the Eucalypts* and simply treated *E. ambigua* as a synonym of *E. stricta*. Bean (2009) explains that this is incorrect, on account of the specimens referred to not constituting type material.

Bean (2009) examined specimens of *E. ambigua* collected by Labillardière and held at G and G-DC, and designated G00131709 as its lectotype, a specimen that consists of two sheets, one of which is sterile, while the second contains mature fruit (Fig. 1). He concluded that the type is conspecific with *E. nitida* and, since the name *E. ambigua* pre-

Abstract

The name *Eucalyptus ambigua* DC. has been suggested as the correct name for a Tasmanian endemic eucalypt, the Smithton Peppermint (herein referred to as *E. nitida* Hook.f.), based on the non-glaucous character of the type specimen. However, the type of *E. ambigua* is inconsistent with other specimens of *E. nitida* housed at the Tasmanian Herbarium, as its fruit is outside the range of sizes observed on *E. nitida*. Its fruit size, non-glaucous character and provenance suggest the strong possibility that *E. ambigua* represents a hybrid or clinal form involving *E. tenuiramis* Miq. and *E. nitida*. Given the high level of uncertainty in determining its exact identity, *E. ambigua* should not be considered an older name for the Smithton Peppermint.

***Key words*:** taxonomy, fruit size, hybridisation in eucalypts

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Figure 1. G00131709, lectotype of *Eucalyptus ambigua* DC., sheet 2.
Image courtesy of Catalogue des herbiers de Genève (CHG). Conservatoire & Jardin botaniques de la Ville de Genève, 28-04-2014 <http://www.ville-ge.ch/musinfo/bd/cjb/chg>.

dates *E. nitida* by 18 years, he argued that the former is the correct name for this taxon. This name change has important consequences, as the Smithton Peppermint is one of Tasmania's most common endemic eucalypts. In light of Bean's (2009) paper, we examined the collections of the Tasmanian Herbarium (HO) and show why we believe Bean's conclusion to be incorrect and unjustified.

Materials and methods

Photographs of the types of *Eucalyptus nitida* and *E. ambigua* were obtained from the Kew Herbarium (K) and the Herbarium of Prodrome de Candolle, housed in Geneva (G-DC), respectively. Ninety-six specimens each of *E. nitida* and *E. tenuiramis* in the Tasmanian Herbarium (HO) collections were chosen to represent the spread of their morphological and geographic ranges.

The diameter of three randomly chosen fruit per specimen was measured, yielding a total of 288 fruit for each species. Fruit diameter measurements were sorted into bins of 0.5 mm and the frequency of measurements in each bin was plotted as a histogram.

Results

The type of *Eucalyptus ambigua* (G00131709) has three fruits, all approximately 9 mm in diameter (Fig. 1). By comparison the mean fruit diameter of *E. nitida* is 6.0 mm ($\sigma = 0.8$ mm), and that of *E. tenuiramis* is 8.6 mm ($\sigma = 1.2$ mm). Figure 2 provides a histogram of fruit diameter frequencies in both *E. nitida* and *E. tenuiramis*, illustrating the relatively small amount of overlap between the two species in the 6–8 mm range. The type of *E. ambigua* is outside the size range of *E. nitida*, but within the range of common fruit diameters of *E. tenuiramis*. However, the photographs of G00131709 show no evidence of glaucous bloom, which is a defining character of *E. tenuiramis*.

Specimens otherwise consistent with *E. tenuiramis*, but not or only slightly glaucous, can be found in the HO collection. For example HO119160 (Fig. 3), collected within the range of localities visited by Labillardière, shows only a hint of waxy bloom in the mature stems.

Discussion

Eucalyptus nitida and *E. tenuiramis* are both endemic to Tasmania and comprehensive collections of both species are housed at the Tasmanian Herbarium (HO). We have examined all these specimens, and strongly disagree with Bean's conclusion. The fruit size of the lectotype of *E. ambigua* is outside the range measured in a representative sample of 96 HO specimens of *E. nitida*. Although Chippendale (1988, p. 192) gives the range of fruit diameters of *E. nitida* as 5–9 mm wide, specimens with fruit at the larger end of this range are rare, and only seven of 288 fruit measured for this study exceeded 8 mm in width. The possibility that fruit towards the larger end of the range are the result of intergrades with other species cannot be discounted. In addition to this, the lectotype of *E. nitida* (K000279983, held at Kew) has fruit that are approximately 4–5 mm in diameter (Fig. 4), compared to the approximately 9 mm-diameter fruit of the type of *E. ambigua*. Specimens of *E. nitida* housed in HO have an average diameter of 6 mm, again significantly smaller than those of the type of *E. ambigua*. The original description of *E. ambigua* (de Candolle 1828, p. 219) states: '*Affinis E. ligustrinae et amygdalinae. Fructus subglobosus duplo major*', thus describing the fruit of *E. ambigua* as twice the size of those of *E. ligustrina* DC. and *E. amygdalina*, the latter of which has a fruit of comparable size to *E. nitida*. Another common peppermint from the area of south-eastern Tasmania in which Labillardière collected is the Silver Peppermint, *E. tenuiramis*. The average diameter of fruits in specimens of *E. tenuiramis* housed in HO (8.6 mm) is closer to that of the type of *E. ambigua*. In addition, the leaves on the type of *E. ambigua* are broader and shorter than those commonly encountered in *E. nitida*, and more typical of the leaves of *E. tenuiramis*.

The non-glaucous nature of the type of *E. ambigua* is used by Bean (2009) to justify his conclusion that this specimen is the same as *E. nitida*. However, specimens otherwise closest to *E. tenuiramis*, but exhibiting little or no glaucous bloom, are found throughout the range of this species, including southern Bruny Island (where Labillardière collected), and these most likely represent instances of introgression with non-glaucous species. *Eucalyptus tenuiramis* and *E. nitida*, like many peppermints, are known to intergrade wherever their ranges overlap, such as in southern Tasmania (Duncan 1989). There is a high probability that non-glaucous specimens identified in the HO collection as *E. tenuiramis* are a result of introgression between *E. tenuiramis* and *E. nitida*. There remains a strong

possibility that G00131709 was collected from just such a clinal population between the two species, exhibiting characters from both parents.

In conclusion, the type of *E. ambigua* is not consistent with the range of morphological variation encountered in *E. nitida*. Its fruit size is within the range of *E. tenuiramis*, however the lack of any glaucous character strongly indicates a degree of introgression with another peppermint, most likely *E. nitida*. The type of *E. ambigua* was collected in an area of Tasmania where clinal forms between the two species are known to occur. Due to the taxonomic uncertainty regarding its type, and the possibility of its clinal origin, the name *E. ambigua* DC. should not be taken up. *Eucalyptus ambigua* is certainly not applicable to the Smithton Peppermint, which we reinstate as *E. nitida*. It may be prudent to formally reject the name *E. ambigua* so that its identity no longer needs to be considered and the name cannot be applied to any species of *Eucalyptus*.

Taxonomy

Eucalyptus ambigua DC., *Prodr.* [A. P. de Candolle] 3: 219 (1828)

Type: **TASMANIA.** New Holland [SE Tasmania], J.J.H. Labillardière *s.n.*, *s.d.* [1792–1793] (lecto: G-DC [G00013170g] *fide* Bean (2009)).

Identity doubtful, most likely a clinal form between *Eucalyptus nitida* and *E. tenuiramis*.

Eucalyptus amygdalina Labill., *Nov. Holl. Pl.* 2: 14 t.154 (1806)

Type: **TASMANIA.** 'in capite Van-Diemen'.

Eucalyptus salicifolia Cav., *Icon. Pl.* 4(1): 24 (1797) (as '*salicifolius*'). Type not cited.

Eucalyptus glandulosa Desf., *Catalogus Plantarum Horti Regii Parisiensis*, ed. 3, 284, 408 (1829). *Type:* 'H. p. N. Holl. Temp'.

Common name: Black Peppermint.

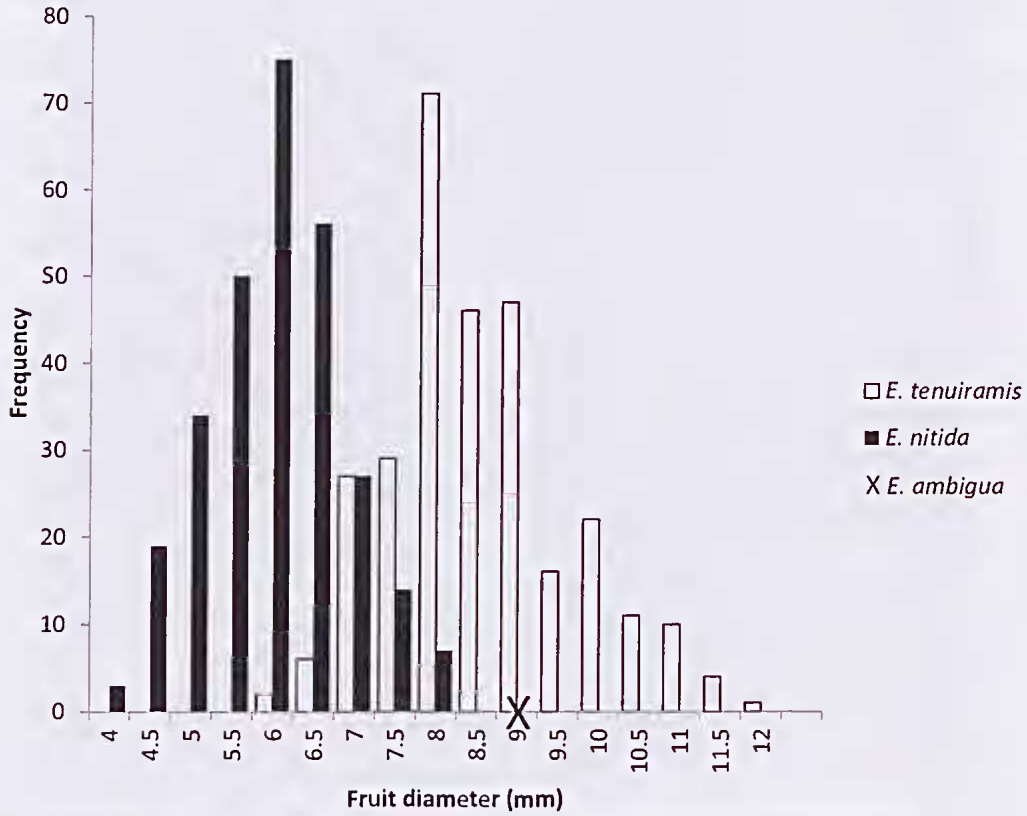

Figure 2. Histogram showing frequency of occurrence of fruit diameters for *Eucalyptus nitida* and *E. tenuiramis* (measured from three separate fruits in 96 specimens of each) along with the same measurement for the type of *E. ambigua*

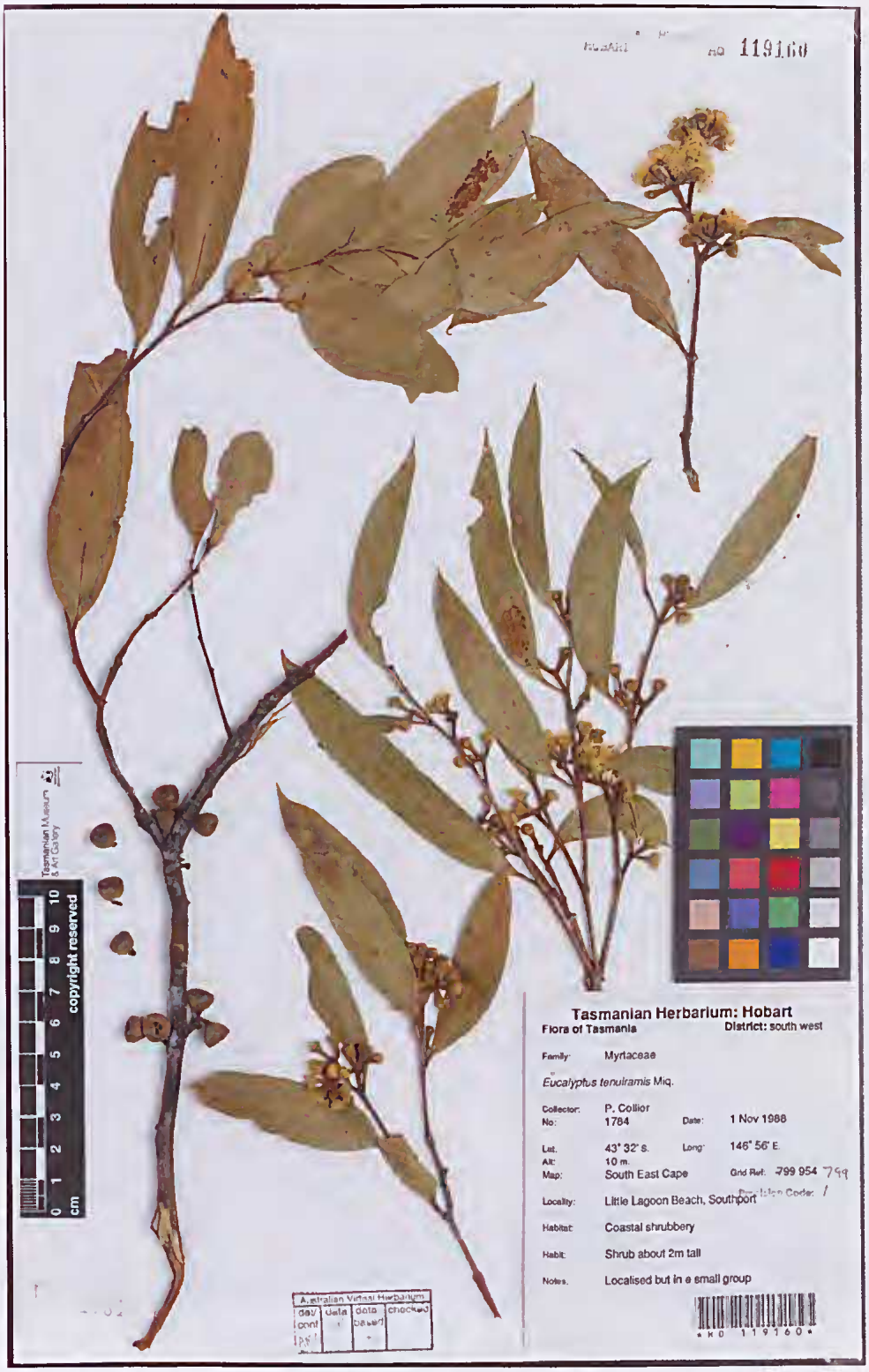

Figure 3. HO119160, *Eucalyptus tenuiramis* from the Southport Lagoon area, one of the possible locations where the type of *E. ambigua* was collected, showing almost no glaucousness

Figure 4. K000279983, lectotype of *Eucalyptus nitida*

Eucalyptus nitida Hook.f., *Bot. Antarct. Voy. III. (Fl. Tasman.)* 1: 137, t. 29 (1856)

Eucalyptus amygdalina var. *nitida* (Hook.f.) Benth., *Fl. Austral.* 3: 203 (1867); *E. australiana* var. *nitida* (Hook.f.) Ewart, *Fl. Victoria* 833 (1931). *Type:* Tasmania. Circular Head, *R.C. Gunn 808*, 21 Jan 1837 (lecto: K [K000279983], *fide* Chippendale (1988)).

Eucalyptus simmondsii Maiden, *Crit. Rev. Eucalyptus* 6: 344 (1923). *Type:* Tasmania. Smithton, *J.H. Simmonds s.n.*, 27 May 1921 (syntypes: NSW [NSW337342, 337343]).

Common name: Smithton Peppermint.

Eucalyptus tenuiramis Miq., *Ned. Kruidk. Arch.* 4: 128 (1856)

***Type:* TASMANIA.** Van Diemensland [?near Southport (Chippendale 1988)], *C. Stuart 11, s.d.* [1842–1857] (Holo: U [U0004997]).

Eucalyptus tasmanica Blakely, *Key Eucalypts* 225 (1934) p.p. (description only, see Gray 1976).

Common name: Silver Peppermint.

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